

## Claims:

1. Electromechanical filtering unit comprising a conduit, preferably cylindrical, capable of conducting electricity, at least one first electrode connectable to a high voltage power supply (EHT) and at least one second electrode having a plurality of discrete openings which is earthed wherein the electrodes are positioned within the  
5 conduit and connected to the conduit such that electricity can pass between the electrodes via the conduit and, preferably, wherein the second electrode occupies the internal cross sectional area of the conduit, and preferably, wherein the first electrode occupies the internal cross sectional area of the conduit.
2. Electromechanical filtering unit according to claim 1 wherein the conduit is  
10 cylindrical.
3. Electromechanical filtering unit according to any of the preceding claims wherein the electrodes occupies almost substantially all the internal cross sectional area of the conduit.
4. Electromechanical filtering unit according to any of the preceding claims  
15 comprising at least two pair of 2 electrodes in series.
5. Filtering process using the electromechanical filtering unit according to any of the preceding claims for removing solid particles suspended in a liquid comprising
  - a. passing a suspension through the conduit in a direction such that the first  
20 electrode is upstream of the second electrode with respect to the directional flow of the suspension,
  - b. generating an electric field within the conduit by connecting the first electrode to the high voltage supplysuch that the solid particles attach themselves to the second electrode and a

liquid with a reduced solids content passes through the conduit.

6. Use of an electromechanical filtering unit according to claims 1 to 4 in a Fischer-Tropsch process for the conversion of gaseous reactants to liquid hydrocarbon products comprising

- 5 a. passing the gaseous reactants and a suspension comprising catalyst suspended in a liquid medium to a reaction zone
- b. converting at least a portion of the gaseous reactants to liquid hydrocarbon products to form a product suspension comprising catalyst suspended in the liquid medium and the liquid hydrocarbon products;
- 10 c. passing at least a portion of the product suspension through the electromechanical filtration unit

wherein at least a portion of the catalyst is separated from the product suspension to provide a concentrated catalyst slurry and a product suspension with a reduced catalyst content.

- 15 7. Use according to claim 6 wherein the concentrated catalyst slurry is recycled to the reaction zone.

- 8. Use of an electromechanical filtering unit according to claims 1 to 4 in a Fischer-Tropsch process for the conversion of gaseous reactants to liquid hydrocarbon products by contacting the gaseous reactants at an elevated temperature and pressure
- 20 with a suspension comprising catalyst suspended in a liquid medium, in a system comprising a high shear mixing zone and a post mixing zone, comprising
  - a. passing the suspension comprising catalyst suspended in the liquid medium through the high shear mixing zone where a gaseous reactant stream comprising the gaseous reactants is mixed with the suspension;
  - 25 b. discharging a mixture comprising gaseous reactants and suspension from the high shear mixing zone into the post mixing zone;
  - c. converting at least a portion of the gaseous reactants to liquid hydrocarbon products in the post mixing zone to form a product suspension comprising catalyst suspended in the liquid medium and the
  - 30 liquid hydrocarbon products;
  - d. separating a gaseous stream comprising unconverted gaseous reactants from the product suspension;
  - e. recycling the separated gaseous stream to the high shear mixing zone

- f. passing at least a portion of the product suspension through the electromechanical filtration unit

wherein at least a portion of the catalyst is separated from the product suspension to provide a concentrated catalyst slurry and a product suspension with a reduced catalyst content.

9. Use according to claim 8 wherein the concentrated catalyst slurry is recycled to the system, preferably to the high shear mixing zone.

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